This Special Issue is published in tribute to the
Croatian Society of Orthodontics Congress
"Orthodontics – this time tomorrow"
that was planned for December 2020
but was canceled due to covid-19 pandemics.

Responsibility for the contents of the special issue articles rests upon the authors and not upon SEJODR, the Editors, or the Publisher

Review

SEJODR

Fixed lingual retainer positioner: A narative review

Medha Lakhanam [1]; Raghavendr Singh [2]; Kamna Srivastava [3]

[1] Department of Orthodontics and Dentofacial Orthopaedics,Gorakhpur (U.P)

[2] Department of Pediatric and Preventive Dentistry,Purvanchal Institute of Dental Sciences, Gorakhpur (U.P)

[3] Department of Orthodontics and Denofacial Orthopaedics, Babu banarasi das college of dental sciences, Lucknow (U.P)

ABSTRACT

Introduction: Retention is one of the most crucial phase of the any orthodontic treatment to maintain the desired result obtained. Therefore, the applying of an appropriate retention method is very important both for prevention of relapse after treatment and for increasing patient satisfaction.

Aim: This research paper aims to evaluate the effectiveness of different methods of fixed retention based on the data available that outlines an evidence-based choice of the retention procedure for different cases.

Material and method: A search in electronic databases (PubMed, Cochrane Library, Science Direct, Embase, ProQuest, Ebsco, Biomed Central, Medline, Lilacs, and Google Scholar) and a manual search with no language restrictions. The inclusion criteria were: randomized clinical trials and meta-analysis, prospective and retrospective studies, studies in humans, clinical and radiographical studies evaluating the periodontium, studies of different retention techniques performed during the 1995-2019 period.

Conclusion: This research paper concludes that adequate stabilization of lingual retainer wire prior to bonding can reduce chair side time in its placement , thereby reducing the chances of contamination and bond failure. Depending on clinicians convenience and ease of adapting a technique, any of these methods can be used to stabilize lingual retainer for effective retention of post treatment result.

Lakham M, Singh R, Srivastava K. Fixed lingual retainer positioner: A narrative review South Eur J Orthod Dentofac Res. 2020;7(S1):2-5.

INTRODUCTION

Angle stated that "the problem involved in retention are greater than the difficulties being encountered in the treatment, and tests the utmost skill of the operator.[1] Retention is one of the most critical phase of Orthodontic treatment that involves use of both removable and fixed retainers. The various retention appliances available include Removable retainers and bonded retainers. Removable retainers have their own advantages and disadvantages, but they need patient's compliance to wear them. Fixed retainers consist of a length of orthodontic wire that is bonded on the lingual aspect of tooth.[2] The major advantages of fixed retainers includes invisibility, minimal patient compliance and provides long term retention.

Though fixed retainers are advantageous, however their placement requires longer working time, has a risk of contamination from saliva and moisture[3], difficulty in adaptation of the retainer wire to lingual surface of anterior teeth[2], hence their stabilization during bonding is a difficult task. If retainer wire can be effectively stabilized over the lingual surface of tooth prior to bonding, bonding becomes a simple process. For this , use of separators (Kesling and elastomeric separators), materials like resin, memosil, glue etc or use of metal Stablizers in form of W, V or use of wires had been used by various author to stabilized fixed retainers.

Bonding of a lingual retainer is a challenging and technique sensitive procedure hence various methods used to stabilize lingual retainer before bonding[4] .The objectives of this article is to compile the different retention techniques used to stabilize the lingual retainer wire for bonding altogether at one place.

Corresponding Author:
Medha Lakhanam
Department of Orthodontics and Dentofacial Orthopaedics,
Gorakhpur (U.P),
India.
e-mail: medhalakhanam@gmail.com

MATERIALS AND METHODS

A search in electronic databases (PubMed, Cochrane Library, Science Direct, Embase, ProQuest, Ebsco, Biomed Central, Medline, Lilacs, and Google Scholar) and a manual search with no language restrictions. The inclusion criteria were: randomized clinical trials and meta-analysis, prospective and retrospective studies, studies in humans, clinical and radiographical studies evaluating the periodontium, studies of different retention techniques performed during the 1995-2019 period. Here in this article we had chosen the various methods that were easily fabricated, less armamentarium requisite and less time consuming for operator.

Summary of the stabilization methods

Stablization of lingual retainer by separator

i. Using Modified Kesling's separator

The conventional Kesling's separator made by 0.014' AJ wilcock wire and used for slow seperation in area offering tight contact, was modified by Nagar et al.[5] by incorporating a perpendicular bend in lower arm to form a 'U'. The U would exert pressure on lingual retainer wire against palatal tooth surface. These were removed after bonding the lingual retainer.

ii. Stablizing lingual retainer wire using Modified Kesling's separator

a. Sahu S. et al. developed retainer positioner that looked like a modified Kesling separator and was made of 0.016" Australian AJ. Wilocock special plus wire.[6] The smaller leg was shorter by 2 mm and positioned labially. The longer leg had offsets which use to keep the positioner away from the lingual mucosa. The incisal offset helds the retainer wire in position.[6]

b. Karthikeyan M.K. et al. developed a Stabilising Spring which is also a modification of kesling seprators is easy to fabricate. 0.016" A.J. Wilcock[7] stainless steel wire was used for the fabrication. In Kesling separator, instead of straight leg, right angle bend was given to the leg overlapping the helix.[7] Then, the wire was bent to form a U-shaped configuration on both the legs, for holding the retainer on the lingual side and on the labial side of the tooth for stabilisation . The length of the spring was determined, based on the clinical crown length extended up to the gingival margin and fixed in the interdental region.[7] The spring should be firm, but not too tight that it injures the gingiva.

iii. Using elastomeric separators

Thamer Adel Alkhadra et al.[8] developed a technique in which lingual retainers wire was passed through the elastomeric separators to stabilize the lingual retainer wire that were placed interdentally between alternate tooth contacts.

Stablization of lingual retainer by other materials

i. Using DuraLay resin transfer

Shin-Jae Lee et al.[9] in 2004 proposed this method of stablising lingual retainer. Before debonding, an impression was taken and poured in hard stone.[9] Lingual retainer wire was adapted on to lingual surface to accurately fit the cast. After application of DuraLay separating medium to the cast, the DuraLay resin is mixed and appllied gently between the distal surface of the second premolar and the mesial surface of the first molar.[9] Duralay resin will act as a template / resin guide to place the lingual retainer in patient's mouth and this is fixed with utility wax. After completing the bonding in anterior segment, terminal portions of wires were cut, resin guide was removed and terminal wires were bonded.

ii. Using Kommon Base Resin

Yoshida Y. et al.[10] introduced a retainer that was adapted with bonding pads made up of Kommon base at the canines. A small amount of Kommon Base Resin was applied to each bonding pad, and cured. Gently remove the appliance from the working cast with a tweezer. Apply a resin-reinforced glass ionomer cement to the interior surfaces of the Kommon bases and retainers was fixed lingually.

iii. Using modeling wax

Hattarki R. et al.[11] described a new method for placement of lingual retainers. For a 3 - 3 retainer, wire was extended to the first premolars. A small sheet of modeling wax was taken and adapted from premolar to premolar, covering the labial and lingual surfaces of the teeth. Wax was removed at the areas corresponding to the centre of each tooth. This transfer tray was used to bond lingual retainer at the trenches cut in the wax.

iv. Using Memosil

Similar to Duralay resin transfer method, O.P. Kharbanda proposed a method using Memosil.[12] Retainer was adapted and fixed on the mesial pit of second premolar using memosil. Tooth pick was cut equal to the interpremolar width at mesial pits of second premolar and placed before memosil sets.[12] This will act like a template to stabilize retainer. After bonding anterior teeth, this assembly was removed and terminal ends were bonded.

v. Using Hot Glue

As proposed by Sahu S.K. et al.[13] template could also be made by hot glue that was fixed on canine and premolar

region using glue gun. The glue positioner is then used in patients's mouth to stabilize lingual retainer.

vi. Using PVS Transfer Tray Technique

Bhardwaj M. et al.[14] used PVS impression material for making transfer tray to bond lingual retainer. PVS impression material was added after mixing on the labial surface of anterior teeth which covers all the incisal edges for proper guidance while placing the tray in patients mouth.[14] On the lingual surface the retainer wire was adapted and secured by vertical arms made from putty. This assembly was placed on patient's mouth after removing from working model.[14]

C. By use of metal stabilizers

i. Ligature Wire Technique

Vibhute PJ. et al.[15] introduced two new different techniques for bonding fixed retainer direct and indirect. In the first technique, lingual retainer wire was stabilized using ligature wire tied to 0.8-0.9 mm hard round SS wire with helices distal to canine at both ends. In the second technique retainer wire was stabilized by individual ligature wire passed through interdental areas.

ii. Using molar bands

Seth V. et al.[16] developed this technique of bonding lingual retainer.The alginate impression was made after reseating the molar bands loosly without cementation. The retainer was secured on the working cast with Super Glue (quickfix) and on the molar bands the terminal ends were soldered.[17] The molar bands alongwith retainer are placed in the patient's mouth by removing carefully from the cast.[17]

iii. W Shaped Lingual Reatiner Wire Stabliser

Garabadu A. et al.[18] constructed a device by soldering two equal pieces of 10 mm of 19 gauge S.S Wire to straight probe at an angle of 45° to each other. These arms hold the wire on lingual surface of upper and lower incisors.[18] The middle arm was the guiding arm that was placed between the central incisor and other two arms were used left and right arm to hold the wire interdentally between lateral incisor and canine of the both sides.[18] This device was easily fabricated, saves the time and adapt the wire perfectly on the lingual surface.

iv. Rest Appliance

Bansal A.[19] developed the Rest stabilizer, with 0.7 mm round SS wire on working model. The wire was bend in V shape with helices away from tissue surface on lingual side. Labial wire assembly was prepared with 0.9 mm round SS wire and V shaped wire components were soldered. This was termed as the "rest appliance" to hold retainer wire.[19]

v. Using "V" clips

Chaudhari CV. et al.[20] used 0.018" AJ Wilcock stainless steel (SS) wire and place it the labial aspect of the tooth. The wire was extended to the incisal area and bend lingually. Markings were done at the area where the fixed lingual retainer was to be given, and round bend was given facing to the lingual embrasure area. After drying from, there was applicaton of the bonding agent. The retainer wire was stabilized with "V" retainer clip on the lingual surface.[21] In general, upper and lower arch requires 4 and 3 clips , respectively. After stabilization, the composite was applied and cured on the lingual surface over the retainer wire.

vi. Lingual Retainer Stabilizer (LIAR)

Srivastava A. et al.[22] fabricated a spring using 24 gauge stainless steel wire to stabilize the lingual retainer. There was fabrication of two concentric helices of 2-3 mm internal diameter followed by the other end being bent into another helix perpendicular to the first loop. The second arm or palatal arm was gradually curved to adapt well on to the lingual/palatal surface of the anterior teeth.[22] A used module strip with equidistant 5-6 holes was taken. The 'U' loop end was engaged in to holes of module and second stabilizer through another hole at the other end. The stabilizers can be engaged through the sequence of holes on the module strip as per requirement during bonding.[22]

Placing the fixed retainer prior to debonding

i. Using modifying archwire

Astekar S. et al.[23] modified the arch wire prior to debonding to stabilize the lingual fixed retainer. In the interdental area between lateral incisor and canine a 90° bend was given in 0.019' × 0.025' stainless steel wire or the last stainless wire (round or rectangular of at least 0.014') used in patient.[23] Another bend of 7 to 8 mm length vertical arm was placed and the construction of the wire was completed by bending the retentive tags in the archwire, which extends lingually.[23] The retainer wire was bend as necessary and secured, the retentive tags were kept away from the bonding areas. The bonding procedure was completed as usual.[23]

ii. Retainer clip stabilizer for lingual retainer

Handral R.K. et al invented a retainer clip stabilizer to stabilize the retention wire.[1] The clip was fabricated by 0.017" × 0.025" TMA wire. To adjuat the wire on the labiopalatal thickness of the tooth a helix was (Bend-A).[1] Two arms were fabricated in which shorter one was on palatal surface and longer one was on labial surface. For adaptation on the the palatal surface, the wire was contoured according tio surface (Bend-B). The labial part

or the longer part was given at right angle for engaging the clip into the slot of the bracket (Bend-C)[1]. To prevent from slippage from the slot one more horizontal bend was given at the labial part of the wire (Bend-D).[1]

CONCLUSION

Adequate stabilization of lingual retainer wire prior to bonding can reduce chair side time in its placement, thereby reducing the chances of contamination and bond failure. Depending on clinicians convenience and ease of adapting a technique, any of these methods can be used to stabilize lingual retainer for effective retention of post treatment result. In general, patients finds permanent bonded retainers more favorable due to its effectiveness, comfort, and aesthetics.[3]

CONFLICT OF INTEREST

The authors of the present article declare no conflicts of interest.

REFERENCES

1. Handral RK, Gogineni R, Mendigeri V. Retainer clip - stabilizer for lingual retainer. J Indian Orthod Soc. 2017;51:134-5.
2. Bearn D.R. Bonded Orthodontic Retainers: A review. Am J Orthod Dentofac Orthop.1995;108:207-13.
3. Eapen JC, Prakash A. Enigma of Fixed Retainers. Orthod J Nepal. 2017:52-5.
4. Ardeshna PA. Fixed Retention In Orthodontics. Decisions in Dentistry. 2019;5(10):16-18,21-22.
5. Nagar N . Modified Kesling's Separators For Stabilizing Lingual Retainer Wire. Annals of Dental Research. 2011;1(1): 96-99.
6. Sahu SK, Jayam BK, Barik AK. Retainer Positioner. J Ind Orthod Soc. 2012;46(1): 53-4.
7. Karthikeyan MK, Prabhakar R, Saravanan R, Rajvikram N, Kuppuchamy. Stabilizing Springs for Fixed Lingual Retainer. Journal of Clinical and Diagnostic Research. 2013; 7(11): 2647-2648.
8. Thamer Adel Alkhadra. A Simplified Technique For Chairside Bonding Of Lingual Retainer. J PDA. 2011;20 (3).
9. Lee SJ . Time-Saving Fixed Lingual Retainer Using Duralay Resin Transfer. Am J Orthod Dentofacial Orthop;125:203-5.
10. Yoshida Y, Nagashima K, Komori A. Simple and Accurate Bonding of Lingual Retainers with Kommon Base. J. Clin. Orthod. 2014; 68(5):292-4.
11. Hattarki RS, Rastogi S, A simple technique for bonding lingual retainer. Int. Journal of Orthodontics .2015;26(1):39-40·
12. Rana SS, Kharbanda OP. A robust method of bonding fixed lingual retainer. Journal of Pierre Fauchard academy.2017;31:64-66.
13. Sahu SK, Gautam N, Sahoo SN, Jagdev S. Glue retainer positioner. J Indian Orthod Soc 2017; 51:139-40.
14. Bhardwaj M, Khattri S, Kulshrestha R. Fabrication of Lingual Retainer made easy. J Clin Adv Dent. 2017;1:26-27.
15. Vibhute PJ. Two new methods for direct bonding 'lingual retainers'. J Indian Soc Pedod Prevent Dent.2009; 27(2):111-115.
16. Seth V, Kamath P, Venkatesh M .J Technique Clinic – A New Method for Bonding Lingual Retainer. Indian Journal of Dental Sciences. 2012;4(1):122-124.
17. Upadhyay M, Yadav S, Keluskar KM. Molar bands for 'precision' bonding of lingual retainers, Journal of Orthodontics, 2007; 34(1):12-15.
18. Garabadu A, Chalasani S, Vaz AC. W-Shaped Lingual Retainer Wire Stabilizer. J Ind Orthod Soc 2011;45(2):150-151.
19. Bansal A. Rest Appliance: Retainer Stabilizing Appliance. J Orthod Endod. 2017; 3:1.
20. Chaudhari CV, Daokar SS, Yamyar SS. Simple Innovative "V" clips for bonded lingual retainer. Int J Orthod Rehabil.2018; 9:130-1.
21. Vijayalakshmi PS, Veereshi AS, Kumar M. Simplified Method of Bonding the Fixed Retainer. J Ind Orthod Soc. 2011; 45(4):260-261.
22. Srivastava A, Tikku T, Khanna R, Maurya RP, Verma SL, Srivastava K. Lingual Retainer Stabilizer (LIAR). Journal of Scientific Achievements, 2017;2(4):16-18.
23. Astekar SS, Deshpande RS, Shetty PS, Chanchad AD. Lingual Retainer Stabilized by Modifying Archwire. J Indian Orthod Soc. 2013; 47(4):483-484.